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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/614,535	07/11/2000	Shmuel Shaffer	2705-103	2031
20575	7590	03/08/2005	EXAMINER	
MARGER JOHNSON & MCCOLLOM, P.C.			SWERDLOW, DANIEL	
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2644

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/614,535

Applicant(s)

SHAFFER ET AL.

Examiner

Daniel Swerdlow

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-65 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 47-65 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 9, 17-19, 21, 25, 32, 33, 36, 37, 41 and 43 is/are rejected.
- 7) ☒ Claim(s) 4, 6-8, 10-16, 20, 22-24, 26-31, 34, 35, 38-40, 42 and 44-46 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The rejections under 35 USC 112 made in the prior Office action mailed on 9 June 2004 are withdrawn in view of applicant's amendment filed 8 October 2004.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 5, 17, 18, 32, 33, 37 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minami (US Patent 4,815,132) in view of Weinstein et al. (IEEE SAC-1 No. 6).
4. Regarding Claim 1, Minami discloses receiving a right channel voice signal and a left channel voice signal (i.e., concurrently captured first and second sound field signals) of a speaker's voice (i.e., representing a single sound field) with right and left channel microphones (i.e., at two spatially separated points) (Fig. 4, reference 1R, 1L; column 4, lines 29-32; column 6, lines 16-18). Minami further discloses an analog to digital converter (Fig. 4, reference 26R; column 6, lines 19-22) that converts the right channel voice signal to a digital signal (i.e., digitally encodes a signal block to represent the sound field signals). Minami further discloses an approximator (Fig. 4, reference 30; column 6, lines 24-54) that approximates a transfer

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function between the right channel voice signal and the left channel voice signal (i.e., estimates relative temporal delay between first and second sound field signals). Minami further discloses a transmitter (Fig. 4, reference 35; column 7, lines 24-30) that transmits the right channel voice signal (i.e., the encoded signal block) and transfer function information (i.e., stereo decoding parameter) to a receiving end (i.e., remote conferencing point). Therefore, Minami anticipates all elements of Claim 1 except transmission in packet format. Weinstein teaches that packet networks offer significant benefits for voice communication including cost and channel capacity savings (p. 963, column 2). As such, it would have been obvious to one skilled in the art at the time of the invention to apply packet transmission as taught by Weinstein to the system taught by Minami for the purpose of realizing the aforesaid advantages.

5. Regarding Claim 2, Minami further discloses transmitting the right channel voice signal and not the left channel voice signal (i.e., selecting one sound field signal as the source of the composite sound field signal and discarding the other sound field signal) (column 7, lines 24-37).

6. Regarding Claim 5, Minami further discloses the main data voice signal synchronized with the additional data (i.e., the relative temporal delay estimated using substantially only sound field signals captured during the same time period) (column 7, lines 7-12).

7. Claims 17 and 18 are essentially similar to Claims 1 and 2, respectively, and are rejected on the same grounds.

8. Claims 32 and 37 are essentially similar to Claim 1 and is rejected on the same grounds.

9. Regarding Claim 33, Minami further discloses right and left analog to digital converters (Fig. 4, reference 26R, 26L; column 6, lines 19-22) that converts the right and left channel voice signal to digital signals, which inherently includes buffering.

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10. Claim 41 is essentially similar to Claim 33 and is rejected on the same grounds.

11. Claims 3, 9, 19, 21, 25, 36 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Minami in view of Weinstein and further in view of Coker et al. (US Patent 4,581,758).

12. Regarding Claim 3, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except calculating a first-to-second sound field cross correlation for each of a plurality of time shifts and selecting a temporal delay corresponding to the time shift generating the largest cross correlation. Coker discloses sound source location by cross correlating two microphone inputs over a series of time intervals (i.e., a plurality of time shifts) (column 2, lines 36-43) and selecting the delay with the greatest correlation (column 9, lines 60-64). It would have been obvious to one skilled in the art at the time of the invention to apply the cross correlation method of determining time delay as taught by Coker to the combination made obvious by Minami and Weinstein for the purpose of locating the sound source in a noisy reverberant environment (Coker: column 2, lines 18-22).

13. Regarding Claim 9, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except the stereo decoding parameter expressing an estimated angle of arrival based on relative delay and positioning of the spatially separated points. Coker discloses sound source location by determining angle from which sound is coming (i.e., angle of arrival) (column 9, lines 60-64) and relative microphone position (i.e., positioning of the spatially separated points) (column 2, lines 25-28). It would have been obvious to one skilled in the art at the time of the invention to apply the angle determination as taught by Coker

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to the combination made obvious by Minami and Weinstein for the purpose of locating the sound source in a noisy reverberant environment (Coker: column 2, lines 18-22).

14. Claims 19, 36 and 43 are essentially similar to Claim 3 and are rejected on the same grounds.

15. Regarding Claim 21, Minami further discloses the main data voice signal synchronized with the additional data (i.e., the relative temporal delay estimated using substantially only sound field signals captured during the same time period) (column 7, lines 7-12).

16. Claim 25 is essentially similar to Claim 9 and is rejected on the same grounds.

Allowable Subject Matter

17. Claims 4, 6 through 8, 10 through 16, 20, 22 through 24, 26 through 31, 34, 35, 38 through 40, 42 and 44 through 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. Regarding Claim 4, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except comprises tracking the beginning and ending of a talkspurt represented in the sound field signals, and limiting the variation of the estimated relative temporal delay during a talkspurt. Coker further teaches deriving delay from energy burst pulses in response to speech sounds, but fails to disclose limiting the variation of the estimated relative temporal delay during a talkspurt. Therefore, Claim 4 is allowable matter.

19. Claims 20 and 38 are essentially similar to Claim 4 and are allowable matter for the same reasons.

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20. Claims 39 and 40 are allowable matter due to dependence from Claim 38.

21. Regarding Claim 6, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except estimating temporal delay using substantially all sound field signals corresponding to the current talkspurt up to and including at least a first portion of the time period. Minami discloses updating the additional data that corresponds to the delay parameter claimed upon the error signal surpassing a threshold (Fig. 6). As such, the delay estimate does not generally correspond to all sound field signals in a current talkspurt.

Therefore, Claim 6 is allowable matter.

22. Claim 22 is essentially similar to Claim 6 and is allowable matter for the same reasons.

23. Regarding Claim 7, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except estimating temporal delay using relative beginnings of a talkspurt. Minami discloses determining transfer function using an adaptive filter. Coker discloses determining delay using cross correlation. As such, the prior art neither anticipates nor makes obvious estimating temporal delay using relative beginnings of a talkspurt.

Therefore, Claim 7 is allowable matter.

24. Claim 23 is essentially similar to Claim 7 and is allowable matter for the same reasons.

25. Regarding Claim 8, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except expressing temporal delay as an integer number of digital sampling intervals. Minami discloses expressing temporal delay as a transfer function using an adaptive filter. Coker discloses expressing temporal delay as a number of 100kHz clock pulses (column 7, lines 53-58). As such, the prior art neither anticipates nor makes obvious

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expressing temporal delay as an integer number of digital sampling intervals. Therefore, Claim 8 is allowable matter.

26. Claim 24 is essentially similar to Claim 8 and is allowable matter for the same reasons.

27. Regarding Claims 10 through 12, 16 and 26 through 28, while the prior art makes obvious the combination of the system taught by Minami and a packet network as taught by Weinstein, there is no suggestion or teaching for the particular formats claimed.

28. Regarding Claim 13, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except the stereo decoding parameter being transmitted once per talkspurt. Minami discloses updating the additional data that corresponds to the stereo decoding parameter claimed upon the error signal surpassing a threshold (Fig. 6). As such, the parameter is not generally transmitted once per talkspurt. Therefore, Claim 13 is allowable matter.

29. Claim 29 is essentially similar to Claim 13 and is allowable matter for the same reasons.

30. Regarding Claim 14, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal (column 4, line 39) that inherently includes relative amplitude (i.e., a stereo balance parameter). However, Minami fails to disclose or fairly suggest an explicit stereo balance parameter as claimed. Therefore, Claim 14 is allowable matter.

31. Claims 30 and 45 are essentially similar to Claim 14 and are allowable matter for the same reasons.

32. Regarding Claim 15, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal as a

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function of frequency (column 4, line 39) that inherently includes estimating signal energy in subbands. However, Minami fails to disclose or fairly suggest an explicit stereo balance parameter as claimed. Therefore, Claim 15 is allowable matter.

33. Claim 31 is essentially similar to Claim 15 and is allowable matter for the same reasons.

34. Regarding Claim 34, as shown above apropos of Claim 1, the combination of Minami and Weinstein makes obvious all elements except receiving concurrently captured first and second sound field signals comprising receiving digital voice samples from a remote conferencing endpoint. Minami discloses receiving a right channel voice signal and a left channel voice signal (i.e., concurrently captured first and second sound field signals) of a speaker's voice (i.e., representing a single sound field) with right and left channel microphones (Fig. 4, reference 1R, 1L; column 4, lines 29-32; column 6, lines 16-18) collocated with other elements. Therefore, the prior fails to anticipate or make obvious receiving the sound field signals from a remote location before encoding. As such, Claim 34 is allowable matter.

35. Regarding Claim 35, Minami further discloses an ADPCM circuit (i.e., encoder) (Fig. 4, reference 34; column 7, lines 24-30) that encodes the voice signal. Therefore, the combination of Minami and Weinstein makes obvious all elements except an adder to create a combined sound field signal. Minami discloses transmitting only the right channel voice signal and additional data. Therefore, the prior fails to anticipate or make obvious an adder to create a combined sound field signal. As such, Claim 35 is allowable matter.

36. Claim 42 is essentially similar to Claim 35 and is allowable matter for the same reasons.

37. Regarding Claim 44, as shown above apropos of Claim 37, the combination of Minami and Weinstein makes obvious all elements except the stereo decoding parameter expressing an

estimated angle of arrival based on relative delay and positioning of the spatially separated points. Coker discloses sound source location by determining angle from which sound is coming (i.e., angle of arrival) (column 9, lines 60-64) and relative microphone position (i.e., positioning of the spatially separated points) (column 2, lines 25-28). However, Minami discloses stereo information integrated as a transfer function and fails to disclose or fairly suggest an explicit arrival angle as claimed. Therefore, Claim 44 is allowable matter.

38. Regarding Claim 46, Minami further discloses transmitting a transfer function defining the relationship between the right channel voice signal and the left channel voice signal as a function of frequency (column 4, line 39) that inherently includes estimating signal energy in subbands and inherently includes relative amplitude (i.e., a stereo balance parameter). However, Minami fails to disclose or fairly suggest an explicit stereo balance parameter as claimed. Therefore, Claim 46 is allowable matter.

39. Claims 47 through 65 are allowed.

40. The following is an examiner's statement of reasons for allowance:

41. Regarding Claim 47, Minami discloses a separator (i.e., parser) (Fig. 4, reference 36; column 7, lines 35-37) that separates the right channel voice signal (i.e., encoded signal block) and the additional data (i.e., stereo decoding parameter). Minami further discloses an ADPCM circuit (i.e., decoder) (Fig. 4, reference 37; column 7, lines 34-35) that decodes the right channel voice signal (i.e., receives and decodes signal blocks) to produce a decoded signal (i.e., voice sample stream). Minami further discloses the filter (i.e., splitter) (Fig. 4, reference 41; column 7, lines 41-43) that is coupled to the right channel voice signal (i.e., voice sample stream) and uses

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the tap coefficients (i.e., stereo decoding parameter) to produce the left channel voice signal (i.e., create multiple output signal channels based on the voice sample stream). Therefore, Minami anticipates all elements of Claim 47 except transmission in packet format. Weinstein teaches that packet networks offer significant benefits for voice communication including cost and channel capacity savings (p. 963, column 2). However, Minami discloses stereo information integrated as a transfer function and fails to disclose or fairly suggest the explicit parameters claimed. Therefore, Claim 47 is allowable matter.

42. Claims 54, 58 and 62 are essentially similar to Claim 47 and are allowable for the same reasons.

43. Claims 48 through 53, 55 through 57, 59 through 61 and 63 through 65 are allowable due to dependence from their respective base claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

44. Applicant's arguments, filed 8 October 2004, with respect to Claims 4, 20 and 38 through 40 and Claims 14, 15, 30, 31 and 44 through 65, as amended, have been fully considered and are persuasive. The rejection of these claims, as amended, has been withdrawn.

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45. Applicant's arguments filed 8 October 2004 with respect to Claims 1 through 5, 9, 17 through 21, 25, 32, 33, 36 through 41 and 43 have been fully considered but they are not persuasive.

46. In the paragraph spanning pages 14 and 15 of the response filed on 8 October 2004, applicant alleges that Minami fails to teach estimating a relative temporal delay as claimed in Claim 1. Examiner respectfully disagrees. Minami discloses determination of a transfer function that transforms one stereo channel into the opposite channel. This function, therefore, necessarily incorporates a relative temporal delay. Further, the transmission of an approximation of the function constitutes an estimate of the temporal delay.

47. In the first complete paragraph on page 15 of the response, applicant alleges that Minami fails to teach "the relative temporal delay associated with the first time period is estimated using substantially only the sound field signals captured during the first time period" as claimed in Claim 5. Examiner respectfully disagrees. As stated above under *Claim Rejections - 35 USC § 103* Minami discloses the main data voice signal synchronized with the additional data (i.e., the transfer function approximation that includes the relative temporal delay). This synchronization indicates that the temporal delay so communicated is the delay associated with same time period during which the audio signals are captured (i.e., the first time period).

48. In the second complete paragraph on page 17 of the response, applicant alleges that Coker fails to teach "calculating ... a first-to-second sound field cross correlation coefficient" as claimed in Claim 3. Examiner respectfully disagrees. As stated above under *Claim Rejections - 35 USC § 103* Coker discloses sound source location by cross correlating two microphone inputs (column 2, lines 36-43), a process that inherently involves calculating a coefficient.

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49. Applicant's remaining unpersuasive arguments are limited to the dependence of claims from those discussed above.

Conclusion

50. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Swerdlow whose telephone number is 703-305-4088. The examiner can normally be reached on Monday through Friday between 8:00 AM and 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh H. Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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2 March 2005


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